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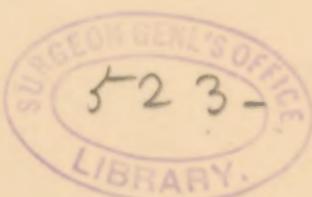
TREATMENT OF TYPHOID FEVER.¹

BY CHARLES W. DULLES, M.D.,
OF PHILADELPHIA.

THE recent appearance of articles on the treatment of typhoid fever advocating principles similar to those that have impressed themselves upon me in the course of my practice prompts me to present the views on this subject that I have come to hold after nearly twenty years of observation and experience. Though these impressions differ in some ways from those that are strongly urged by certain writers on typhoid fever, I present them with confidence, because I see in various places that opinions I once held with hesitation, as unorthodox and somewhat hazardous, are held by others, independently drawing conclusions from their own experience.

My experience in the treatment of typhoid fever has ranged from cases so mild as to leave some doubt in regard to the diagnosis to cases so severe as to be marked by hemorrhages from the bowels, kidneys, and lungs, with delirium and collapse; so that I have had sufficient opportunity to test the teachings of others and the deductions from my own observations since my student days.

¹ Read before the College of Physicians of Philadelphia November 7, 1894.



The principles of the treatment of typhoid fever may be summarized, I think, as consisting in: first, careful maintenance of the natural processes of excretion; second, the judicious administration of food—finding a mean between starvation and over-loading the alimentary canal; third, moderate regulation of temperature; and, fourth, medication reduced to the lowest possible point and shaped to meet definite indications. Nothing in these principles is novel; but I do not think the text-books put them as forcibly as might be done with advantage to students and young practitioners.

In regard to the first matter, I would say that the views in regard to auto-intoxication, expressed by Bouchard at the International Medical Congress held at Geneva, in 1877, impressed me at that time as being of very wide applicability. He applied them especially to typhoid fever, in which disease, if ever, we have an accumulation in the intestinal canal of material which taxes to the utmost the powers of elimination possessed by the patient. Here, if ever, we need to see that no interference with the process of excretion takes place, but that, on the other hand, aid shall be given to the excretory function of the lungs, the skin, the kidneys, and the bowels. For the lungs, we need fresh air, with careful avoidance of undue chilling; for the skin, we need, again, abundance of fresh air, judicious management of bed and body coverings, and the application to the skin of some form of hydro-therapy. To the kidneys unremitting attention should be given in every case of typhoid fever. The urine should be examined often for albumin

and for tube-casts; and in every case the quantity of liquid drunk by the patient and the amount of urine passed should be known. I believe that much of the delirium of typhoid fever might be avoided if the kidneys were considered as carefully as the intestines. During the entire progress of a bad case the tendency of the urine to hyperacidity should be combated by the free use of water and dilute alkaline solutions. From my experience I should say that the best form of the latter is the solution of ammonium acetate with the addition of potassium acetate.¹ I have found it desirable, also, in these cases to induce patients to drink water freely, by giving it to them in forms which are agreeable to sick persons as well as to well ones: for example, carbonated waters, or plain water slightly acidulated with lemon-juice, or weak tea, hot or cold, flavored with a little lemon-juice and sugar, in the manner so widely known as "iced tea."

Of the various modes of elimination, I have chosen to refer last to that from the bowels, because it is in some respects the most important and in some respects the most neglected. My own observation

¹ To make a preparation of ammonium acetate and potassium acetate that is not very disagreeable, I order a mixture containing one-hundred-and-sixty grains of potassium acetate in three ounces of the solution of ammonium acetate sweetened with one ounce of syrup of lemon. To this I add ten grains of quinin sulphate, and order the mixture to be filtered by the druggist. The dose is a dessertspoonful, taken with a wineglassful of water, about four times a day. The quinin substitutes for the mawkish taste of the potassium a distinctly bitter taste, and that part of it (which is considerable) that is not dissolved in the mixture is filtered out, in order to make a better-looking preparation. To each dose I sometimes recommend the addition of a few drops of lemon-juice.

leads me to think that too great fear is sometimes felt for the diarrhea of typhoid fever. This diarrhea is the result of Nature's efforts to get rid of material that is injurious to the patient; and I believe, on the one hand, it would be less likely to occur if the physician secured proper evacuations from the bowels before the diarrhea began, and, on the other hand, that lives are sometimes sacrificed in a desire to check it. This endeavor seems to overlook the indications furnished by the natural course of a case of typhoid fever, as well as the principle that the contents of foul cavities in the body—whether these be natural cavities, like the pleural cavity or the peritoneal cavity, or unnatural cavities, like those of abscesses—shall be removed. I think it important at the outset of a case of typhoid fever to secure a thorough clearing out of the entire intestinal canal—not merely a single purging, but several moderate ones, which shall quite empty the whole tract. After this I believe that the bowels should be relieved with mild saline laxatives, like Rochelle salts, or with small and repeated doses of calomel, at least every third day, unless the case is one in which Nature provides this form of relief. As for astringents, I think the occasions for their use are extremely few. This is especially true of astringents administered by the mouth. Astringents administered by rectal intubation, I think, are of little more value than simple lavements of the sort now called "enteroclysis," but which the students of Monti became familiar with some twenty years ago in Vienna, where it was called "irrigation of the colon." This I have practised on suitable occasions for seventeen

years. Such irrigations are useful in several ways—for cleansing, for cooling, for assuaging thirst—but at this time I do not care to discuss details. The sum of what I believe in regard to elimination from the bowels is that it should be facilitated, and that, instead of attempting to check it, the object should be to regulate what Nature may be doing in an irritating and irregular fashion.

The second important point in the treatment of typhoid fever is, I think, the judicious administration of food. It goes naturally with what has been said in regard to checking Nature's efforts at elimination, to say that Nature should not be harassed by having burdens laid upon a weakened and irritable intestinal canal. The teachings of physiology and of ordinary common sense are opposed to the introduction into the alimentary canal of a sick person of more food than he can either appropriate or cast out. A healthy person can dispose of a large excess of unneeded ingesta, but a patient with typhoid fever cannot. I am sure I have seen patients killed and others nearly killed by relentless feeding, practised by physicians who have, without judgment, followed the teachings of writers who advocate what is called "regular" feeding, and especially with milk-food, in typhoid fever. Forcing patients to take measured quantities of milk at short intervals sometimes results in a diarrhea which shows that Nature repudiates the imposition—the stools resembling those of sick, milk-fed infants. At other times, when milk is given, the milk-water and salts are absorbed while the casein remains undigested and accumulates in the lower bowel until a condi-

tion of coprostasis is set up, in which the patient is subjected to the dangers of total obstruction to elimination from the bowels and to horrible pains and violence when the mass of solid feces is finally expelled by an act of Nature or by the stimulation of cathartics.

An error of another sort is committed when certain extracts of beef are administered with the idea that they are highly nutritious. To support this belief there are, I think, only an untenable theory and deductions which the facts do not warrant. I feel sure that the advantage to patients of preparations such as Valentine's meat-juice is chiefly that they are so costly that not much is likely to be given, and that they contain so little tissue-building material that they do not oppress the digestion or overload the intestinal canal. Such food probably contains, bulk for bulk, less tissue-building material than is found in the white of a chicken's egg, and is equally innocent. Beef-tea is now generally recognized as a substance which is useful for the same reason, namely, that it does not burden the intestinal canal, while it gives both patient and friends a sense of security which is very desirable in all medical cases. This suggests what I believe is one of the most important points in the management of typhoid-fever cases, namely, that they should be given as little food as possible—not as much as can be forced down them.

My own rule—which I have found has been that of others—in almost all cases of sickness, in young and old, is to say that patients may eat when they wish to, and go without eating when they have no

desire for food. I let them drink all they want to, and give them food which shall resemble as little as possible those trying things that remind a patient of his sickness. I give a list of permissible foods, and tell the nurse or members of the family to get up a little meal for a patient who is conscious enough to appreciate it. I sanction the use of the albumin-water already referred to (cool water in which the white of an egg has been stirred up, with the addition of some pleasant flavor), and of almost all clear soups as they are prepared for well persons. I give milk, plain or peptonized, or made more palatable and less constipating by the addition to it of some good preparation of cocoa. I allow tea and coffee, with plenty of cream and milk, which often do good, and which I have never known to do harm if used with ordinary judgment. I have no fear of eggs, and give them whenever a patient with typhoid fever or any other fever wishes them, either soft-boiled or stirred.

Besides this, if I have a patient whose bowels are acting nicely I give custards and simple corn-starch preparations. A patient who can digest anything can digest these foods; and a patient who cannot digest anything will not want anything to eat; and, according to my views, he will require nothing but albumin-water and thin soups.

When we recall, on the one hand, the fact that persons making more or less constant exertions have gone for weeks without food and without serious impairment to their health, and, on the other hand, that fevered intestines are in no condition to do much in the way of digestion, and

are capable of taking up only foods which contain finely divided or soluble hydrocarbonaceous substances and albuminoids that make their way through the intestinal walls without digestion, we can, I think, understand that not much food is needed to keep fever-patients from starving, and that this food should be of the very simplest character.

Further, when we reflect that perforation of the bowels is most likely to occur when the bowels are obstructed and distended with gas, and that this accident does not result from the unimpeded movement of soft fecal matter, but that the intestines are rather advantaged by the internal drainage which such a process secures, we can understand that, while the bowels are not constipated but moving freely, there is no need to restrict a patient to food like milk, which is almost entirely composed of water, and which has but little residue. Because I think this is true, I believe that typhoid-fever patients who have reached the stage in which they feel an inclination for food may be allowed moderate quantities of any soft food, like thick soups (digestible, of course), good fresh fish, and the soft part of oysters, with occasionally sweet-bread or beef's tongue, with eggs, milk and cream. Of vegetables, I think baked or mashed potatoes may be used, and rice and corn-starch preparations, with thoroughly boiled oatmeal and such things as spinach or well-boiled onions and very moderate quantities of toasted bread thoroughly softened with boiling hot water and seasoned, as well as soft milk-toast. For relishes, cocoa, tea and coffee may be

used, and, for desserts, jellies, ice-cream, and orange-juice in moderate quantities.

The third point in regard to the treatment of typhoid fever about which I wish to speak is the regulation of the temperature. Views on this subject have undergone considerable modifications within the time covered by my own experience. At one time the greatest stress was laid upon lowering the temperature of fever-patients. This plan has given way to a more rational one, that recognizes a principle known as long ago as the time of Asclepiades, two thousand years ago—namely, that fever may of itself be a curative process or the mark of a process which is useful. I think the majority of thoughtful medical men are entirely satisfied if a patient presents the general appearance of doing well, even though the temperature be several degrees above 100° Fahrenheit. If a patient is really suffering from high temperature, I think the first attempt to reduce it should consist in having removed the needless bed-covers with which fever patients are often burdened, as the air constitutes one of the best and safest means of properly reducing the temperature. After this, I have found that sponging with cool water, especially upon the abdomen, is pleasant to the patient, and I think it has a distinctly beneficial influence upon the temperature and the inflammation within the abdominal cavity. In some cases I advise that a few light layers of muslin or gauze such as surgeons use be laid upon the abdomen and moistened at times with ice-water gently squeezed from cotton or a sponge.

In a few cases I have found it convenient to have such light cloths "ironed" occasionally with a small piece of ice.

My experience with drugs given to reduce temperature by means of their physiologic action has led me to abandon their use; not because I have ever seen them do harm, but because I do not believe they really do good, and I think it better to let the temperature alone as long as it is in bounds, and, if it requires repressing, to effect this with external applications of cool air and cool water. Since I have adopted this plan I have found it to work according to the expression attributed to Asclepiades, namely, "*cito, tuto et jucunde.*"

This suggests the last of the points which I have mentioned as constituting, in my opinion, those most important in the treatment of typhoid fever, namely, that which concerns medication. I am not peculiar in believing that medication should be reduced to the lowest point and that it should be shaped to meet definite indications. As I have already said, I think the bowels should be well opened at the beginning of a case believed to be one of typhoid fever, and that when the diagnosis is established they should be kept open. I have also suggested the use of mild diuretics, the tendency of which is to reduce the acidity of the urine and to increase the solubility of its solid contents. With these procedures, intended to aid elimination, I think it is useful to administer what are known as intestinal antiseptics. These appear to do something which is not yet explained by any laboratory-observations; and, from the time when turpentine

was first used until the present time, when it is the rival of modern chemic inventions, intestinal anti-septics have seemed to be of distinct value in the treatment of typhoid fever ; for, in addition to their purifying action in the bowel, they appear to exercise a beneficial influence upon the nervous system. Turpentine and its congeners have tonic and stimulating properties in addition to their antiseptic influence, and drugs like salol probably control pain, not only by acting upon the fluids circulating in the bloodvessels and lymphatics, but also by directly influencing the brain and nervous system. I think turpentine and salol are two valuable drugs, if given in moderate quantities and with care that the turpentine shall not be pushed to the point of producing strangury, and that the salol shall not be pushed to the point of producing carbolic-acid intoxication. In certain conditions I think morphin may be used, and should be used, without hesitation. But these circumstances are rare. The bromids (and I prefer sodium bromid) are useful as occasional remedies. So is sulfonal, and so is trional, to control restlessness and to secure sleep, in the absence of pain, on which they have no effect whatever. Phenacetin is also useful with a view to controlling nervous irritability, bearing in mind its effect in producing perspiration. I believe that at times pepsin-solutions, with dilute hydrochloric acid added, are useful as an aid to digestion and the natural processes in the intestines, and not as medicine.

My view in regard to alcoholic stimulants is that they are seldom required, and never in the large quantities sometimes prescribed. There are times

when a dose of a teaspoonful of whiskey in a little hot water, repeated every ten minutes, may tide over a short period of weakness or collapse; but I think the administration of such quantities as eight or sixteen fluidounces of whiskey in twenty-four hours is not good practice; while I believe that hot tea or coffee, without cream or milk, may be used instead of the smaller quantities of alcohol just mentioned.

I have not attempted to describe in detail the mode of treating typhoid fever, but only to state the general principles which impress themselves upon me as correct after a reasonable experience. These are, as stated: 1, careful maintenance of the natural processes of excretion; 2, the judicious administration of food; 3, moderate regulation of temperature; 4, medication reduced to the lowest possible point. My object in discussing the subject at this time is not so much to present my own opinions as to put them in evidence in order to strengthen the hands of those who have recently contended for what I believe is the rational mode of treating this very serious disease.

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